

Claims

1. A homogeneous multilayer structure comprising:
a plurality of substrate layers defining
levels and having surfaces;
- 5 a plurality of metal layers disposed on said
surfaces of plurality of substrate layers;
- a plurality of groundplanes comprising a
first subset of said plurality of metal layers connected by
a first plurality of conductors; and
- 10 at least one coupler comprising a plurality
of coupler segments, wherein said plurality of coupler
segments comprises a second subset of said plurality of
metal layers connected by a second plurality of conductors,
and wherein at least two of said plurality of coupler
15 segments are on different levels.
2. The homogeneous multilayer structure of claim
1, wherein said plurality of substrate layers comprise a
polytetrafluoroethylene composite.
3. The homogeneous multilayer structure of claim
20 1, wherein said first plurality of conductors and said
second plurality of conductors comprise via holes.
4. The homogeneous multilayer structure of claim
1, wherein said second plurality of conductors comprises
slabline transmission lines.

5. The homogeneous multilayer structure of claim
1, wherein said at least one coupler has a frequency of
operation between approximately 0.5 GHz and approximately
6.0 GHz.

5 6. The homogeneous multilayer structure of claim
1, wherein said at least one coupler is a wideband coupler.

7. The homogeneous multilayer structure of claim
6, wherein said wideband coupler is a non-uniform coupled
structure.

10 8. The homogeneous multilayer structure of claim
6, wherein said wideband coupler is a Cappucci coupler.

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9. A method of manufacturing a coupler comprising
the steps of:

15 manufacturing a plurality of substrate
layers;

etching at least five metal layers,
comprising a first metal layer, a second metal layer, a
third metal layer, a fourth metal layer, and a fifth metal
layer, disposed on at least a subset of said plurality of
substrate layers, wherein said second metal layer is part of
20 a segment of a coupler and is between said first metal layer
and said third metal layer, said third metal layer is
between said second metal layer and said fourth metal layer,
and said fourth metal layer is part of another segment of a

coupler and is between said third metal layer and said fifth metal layer;

connecting said third metal layer to said first metal layer and said fifth metal layer to form
5 groundplanes; and

connecting said second metal layer to said fourth metal layer to form a coupler.

10. The method of manufacturing a coupler of claim 9, wherein said plurality of substrate layers comprise
10 a polytetrafluoroethylene composite.

11. The method of manufacturing a coupler of claim 9, wherein via holes are used to connect at least two of said at least five metal layers.

15 claim 9, wherein slabline transmission lines are used to connect at least two of said at least five metal layers.

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13. The method of manufacturing a coupler of claim 9, wherein said coupler has a frequency of operation between approximately 0.5 GHz and approximately 6.0 GHz.

20 14. The method of manufacturing a coupler of claim 9, wherein said coupler is a wideband coupler.

15. The method of manufacturing a coupler of
claim 14, wherein said wideband coupler is a non-uniform
coupled structure.

16. The method of manufacturing a coupler of
5 claim 14, wherein said wideband coupler is a Cappucci
coupler.

17. A homogeneous multilayer structure
comprising:

10 substrate means for defining levels and
surfaces;

metal layer means disposed on said surfaces
to define a plurality of conducting layers;

grounding means comprising a first subset of
said plurality of conducting layers;

15 first conducting means for connecting said
grounding means; and

coupler means comprising a plurality of
coupler segment means, wherein said plurality of coupler
segment means comprises a second subset of said plurality of
20 conducting layers, and wherein at least two of said
plurality of coupler segment means are on different levels.

second conducting means for connecting said
coupler segment means.

18. The homogeneous multilayer structure of claim
17, wherein said substrate means comprises a
polytetrafluoroethylene composite.

19. The homogeneous multilayer structure of claim
5 17, wherein said first conducting means and said second
conducting means comprise via holes means.

20. The homogeneous multilayer structure of claim
17, wherein said second conducting means comprises slabline
transmission line means.

10 21. The homogeneous multilayer structure of claim
17, wherein said coupler means has a frequency of operation
between approximately 0.5 GHz and approximately 6.0 GHz.

22. The homogeneous multilayer structure of claim
17, wherein said coupler means is a wideband coupler.

15 23. The homogeneous multilayer structure of claim
22, wherein said wideband coupler is a non-uniform coupled
structure.

24. The homogeneous multilayer structure of claim
22, wherein said wideband coupler is a Cappucci coupler.

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